claims renumbered ex. amdt

9/6/05 BMH

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1-10 are canceled

1

11. (Currently Amended) An apparatus for treating subsurface water comprises:

a well having a casing with an inlet screen and outlet screen to promote a recirculation of water into the casing and through surrounding ground area.

at least one microporous diffuser disposed in the injection well that allows delivery of ~~a~~ first and second fluids with one of the fluids forming a coating over the other one of the fluids;

an ozone generator;

an air compressor and compressor/pump control mechanism to deliver ozone (O3) from the ozone generator to the microporous diffuser as one of the fluids;

a source of the liquid hydroperoxides selected from the group consisting of formic peracid, hydroxymethyl hydroperoxide, 1-hydroxylethyl hydroperoxide, and chloroformic peracid or their derivatives; and

a feed mechanism to deliver the selected liquid hydroperoxide to the microporous diffuser as the second one of the fluids.

2 1

12. (Original) The apparatus of claim 11 wherein the feed mechanism is a pump.

3 1

13. (Currently Amended) The apparatus of claim 11 wherein the microporous diffuser comprises a central inner chamber and an outer chamber and the apparatus is configured to deliver air with the ozone ~~is delivered~~ to ~~a~~ the central inner chamber of the microporous diffuser and the liquid hydroperoxide ~~is delivered~~ to ~~an~~ the outer chamber of the microporous diffuser.

14. (Original) The apparatus of claim 11 wherein the microporous diffuser has a porosity characteristic that permits bubbles of 5-200 microns diameter to be released into the surrounding formation.

15. (Currently Amended) An apparatus for treating subsurface water comprises:

an sparging apparatus that is disposed through a soil formation, the sparging apparatus comprising:

a microporous diffuser positioned through a bore hole disposed through the soil formation or is of a type that is injected into the soil formation;

a treatment control system comprising:

an air compressor that feeds a mixture of air/ozone into the microporous diffuser and

a feed mechanism to supply to the microporous diffuser a liquid decontamination agent comprising a hydroperoxide.

16. (Original) The sparging apparatus of claim 15 wherein the microporous diffuser is disposed through a vadose zone and an underlying aquifer in the soil formation.

17. (Original) The sparging apparatus of claim 15 wherein the microporous diffuser is coupled to appropriate piping to connect sources of decontamination agents to the microporous diffuser.

18. (Currently Amended) The sparging apparatus of claim 15 wherein ~~when fluid is injected through~~ the microporous diffuser has a first port that receives the air ozone mixture and a second port that receives the hydroperoxide, with the microporous diffuser producing microbubbles of air/ozone and the hydroperoxide ~~enables a water pattern to evolved about diffuser where light bubbles tend to travel upwards and heavier bubbles tend to travel downwards~~.

17 16
19. (Original) The apparatus of claim ~~15~~ 18 wherein the microporous diffuser has a porosity characteristic that permits bubbles of 5-200 microns diameter to be released into the surrounding formation.

5 1
20. (Previously Presented) The apparatus of claim 11 wherein the microporous diffuser has a porosity characteristic that permits bubbles in a range of 50 to 200 microns to be released into the surrounding formation.

6 1
21. (Previously Presented) The apparatus of claim 11 wherein the microporous diffuser has a porosity characteristic that permits bubbles in a range of 1 to 50 microns to be released into the surrounding formation.

7 1
22. (Previously Presented) The apparatus of claim 11 wherein the microporous diffuser has a porosity characteristic that permits bubbles in a range of 1 to 20 microns to be released into the surrounding formation.

8 1
23. (Currently Amended) The apparatus of claim 11 wherein the apparatus is configured to deliver peroxide acid as a coating over microbubbles that emanate from the microporous diffuser ~~reacts with the aromatic rings of such compounds to break the rings into fragments that partition from a liquid to gas phase bringing them even more rapidly into contact with the gaseous ozone content~~.

9 1
24. (Currently Amended) The apparatus of claim 11 wherein the apparatus is configured to deliver organic hydroperoxides as coatings over micorbubbles that emanate from the microporous diffuser~~are injected with the laminated microporous diffusers as a coating for the microporous emulsions~~.

10 1
25. (Currently Amended) The apparatus of claim ~~11~~ wherein the apparatus is configured to deliver ~~Typical conditions for~~ the air/ozone flow ~~are as follows~~ at an air flow rate of 3-5 CFM, an ozone flow rate of 144-430 gm/day, and an hydroperoxide flow rate of 5-50 gal/day.

9/6/05 BMM

11 1
26. (Currently Amended) The apparatus of claim ~~11~~ wherein ~~typical conditions for~~ the apparatus is configured to deliver ~~the air/ozone flow are~~ a percent concentration of hydroperoxide in water in a range of ~~(2-20)~~ 2-20 percent.

9/6/05 BMM

12 1
27. (Previously Presented) The apparatus of claim ~~11~~ wherein the hydroperoxide as a coating on the microbubbles serves to mitigate other competing reactions that can occur when chlorinated olefins double bonded carbon atoms are attacked by the ozone as chlorinated olefins enter the microbubbles.

18 13
28. (Currently Amended) The apparatus of claim ~~15~~ wherein the apparatus is configured to deliver the hydroperoxide ~~are~~ that is an intermediary products in reactions involving chlorinated olefins and ozone.

19 13
29. (Currently Amended) The apparatus of claim ~~15~~ wherein the apparatus is configured to deliver the hydroperoxide ~~are~~ selected from the group consisting of formic peracid, hydrogen peroxide, hydroxymethyl hydroperoxide, 1-hydroxymethyl hydroperoxide, and chloroformic peracid.

20 13
30. (Currently Amended) The apparatus of claim ~~15~~ wherein the apparatus is configured to deliver the hydroperoxide as a coating on ~~the~~ microbubbles, comprising air and ozone, the hydroperoxide serves to mitigate other competing reactions that can occur when chlorinated olefins double bonded carbon atoms are attacked by the ozone as chlorinated olefins enter the microbubbles.

21 13
31. (Previously Presented) The apparatus of claim ~~15~~ wherein the microporous diffuser has a porosity characteristic that permits bubbles in a range of 50 to 200 microns to be released into the surrounding formation.

22 13
32. (Previously Presented) The apparatus of claim ~~15~~ wherein the microporous diffuser has a porosity characteristic that permits bubbles in a range of 1 to 50 microns to be released into the surrounding formation.

23 13
33. (Previously Presented) The apparatus of claim ~~15~~ wherein the microporous diffuser has a porosity characteristic that permits bubbles in a range of 1 to 20 microns to be released into the surrounding formation.

24 13
34. (Currently Amended) The apparatus of claim ~~15~~ wherein the hydroperoxide is peroxide acid ~~coating reacts with the aromatic rings of such compounds to break the rings into fragments that partition from a liquid to gas phase bringing them even more rapidly into contact with the gaseous ozone content~~.

25 13
35. (Currently Amended) The apparatus of claim ~~15~~ wherein the microporous diffuser is a laminar microporous diffuser and the apparatus is configured to deliver the organic hydroperoxides ~~are injected with the laminated~~ to the laminar microporous ~~diffusers~~ diffuser, with the laminar microporous diffuser producing microbubbles with the hydroperoxide as a coating over the microbubbles ~~for the microporous emulsions~~.

26 13
36. (Currently Amended) The apparatus of claim ~~15~~ wherein ~~typical conditions for~~ the apparatus is configured to deliver the air/ozone at a ~~flow are~~ air flow rate of 3-5 CFM, an ozone flow rate of 144-430 gms/day, and a hydroperoxide flow rate of 5-50 gal/day.

27 13
37. (Currently Amended) The apparatus of claim 15 wherein the apparatus is configured to deliver a percent concentration of hydroperoxide in water ~~is~~ in a range of (2-20) percent.